

WHAT IS CLAIMED IS:

1. A pop-off valve for relieving pressure in a pressure medium, comprising:
 - a housing adapted for connection to a portion of a drive device containing the pressure medium;
 - a pressure body movably disposed in the housing such that, in operation, a first side of the pressure body is exposed to the pressure medium while a second side is exposed to a reference force; and
 - a control device adapted to receive at least one signal concerning at least one operating parameter of the drive device and, in response to the operating parameter signal, to control the reference force,wherein, as a result of movement of the pressure body within the housing, at least one first opening in the housing is exposed, permitting venting of the pressure medium.
2. The pop-off valve of claim 1, wherein the drive device comprises an internal combustion engine.
3. The pop-off valve of claim 2, wherein the internal combustion engine is adapted for use in an aircraft.
4. The pop-off valve of claim 2, wherein the portion of the drive device is selected from a group comprising: a plenum, an intercooler, an air passage, and an intake manifold.
5. The pop-off valve of claim 2, wherein the at least one operating parameter is selected from a group comprising: ambient temperature, ambient air pressure, pressure of the pressure medium, temperature of the pressure medium, temperature of the internal combustion engine, rotational speed of the internal combustion engine, and vibrational characteristics of the internal combustion engine.
6. The pop-off valve of claim 4, wherein the at least one operating parameter is selected from a group comprising: ambient air temperature, ambient air pressure, pressure of the pressure medium, pressure of the pressure medium in the plenum, pressure of the pressure medium in the intercooler, pressure of the pressure medium in the air passage, pressure of the pressure medium in the intake manifold, temperature of the pressure medium, temperature of

the pressure medium in the plenum, temperature of the pressure medium in the intercooler, temperature of the pressure medium in the air passage, temperature of the pressure medium in the intake manifold, temperature of the internal combustion engine, rotational speed of the internal combustion engine, and vibrational characteristics of the internal combustion engine.

7. The pop-off valve of claim 1, further comprising:

an attachment fitting on the housing, disposed around a second opening in the housing, permitting the housing to be attached to the drive device; and

a spring disposed between the housing and the pressure body, the spring biasing the pressure body into engagement with the second opening.

8. The pop-off valve of claim 7, wherein:

the housing defines a valve chamber, a third opening into the valve chamber, and a bore,

the second opening is disposed at one end of the bore adjacent to the at least one first opening,

the pressure body is disposed within the bore, and

the third opening permits the pressurized medium to fill the valve chamber by throttled pressure equalization.

9. The pop-off valve of claim 7, wherein:

the housing defines a valve chamber and a bore,

the second opening is disposed at one end of the bore adjacent to the at least one first opening,

the pressure body is disposed within the bore,

the pressure body comprising a crown defining a third opening therethrough, permitting the pressurized medium to fill the valve chamber by throttled pressure equalization.

10. The pop-off valve of claim 1, wherein the housing defines a valve chamber and the control device comprises a control valve operatively connected to the valve chamber to control the pressure of the pressurized medium therein, thereby controlling the reference force.

11. The pop-off valve of claim 8, wherein the control device comprises a control valve operatively connected to the valve chamber to control the pressure of the pressurized medium therein, thereby controlling the reference force.
12. The pop-off valve of claim 9, wherein the control device comprises a control valve operatively connected to the valve chamber to control the pressure of the pressurized medium therein, thereby controlling the reference force.
13. The pop-off valve of claim 10, wherein the control valve is normally closed.
14. The pop-off valve of claim 11, wherein the control valve is normally closed.
15. The pop-off valve of claim 12, wherein the control valve is normally closed.
16. The pop-off valve of claim 9, wherein the pressure body comprises a piston.
17. The pop-off valve of claim 16, wherein the piston further comprises:
 - a smaller diameter portion;
 - a larger diameter portion; and
 - a step connecting the smaller diameter portion to the larger diameter portion,wherein the bore defines a lip that acts as a stop for the piston when the piston seals the second opening.
18. The pop-off valve of claim 10, further comprising:
 - a pressurized medium conduit connecting the valve chamber to the control valve.
19. The pop-off valve of claim 10, wherein:
 - when the control valve lowers the pressure of the pressurized medium within the valve chamber, the pressurized medium within the portion of the drive device acts on the pressure body to push the pressure body into the valve chamber, and
 - when the pressure body moves to a position where the at least one first opening is exposed, the pressurized medium exits from the bore through the at least one first opening.
20. The pop-off valve of claim 9, further comprising:

a pressurized medium conduit connecting the valve chamber to the control valve.

21. The pop-off valve of claim 9, wherein:

when the control valve lowers the pressure of the pressurized medium within the valve chamber, the pressurized medium within the portion of the drive device acts on the crown of the pressure body to push the pressure body into the valve chamber, and

when the crown of the pressure body moves to a position where the at least one first opening is exposed, the pressurized medium exits from the bore through the at least one first opening.

22. The pop-off valve of claim 21, wherein:

the housing defines a central axis and the piston travels along the central axis,

the second opening is positioned on the central axis, and

the at least one first opening is disposed through the bore at a radial position from the central axis.

23. A process for controlling pressure in a drive device, comprising:

providing a pop-off valve, comprising a housing adapted for connection to a portion of the drive device containing a pressure medium and a pressure body movably disposed in the housing such that, in operation, a first side of the pressure body is exposed to the pressure medium while a second side is exposed to a reference force;

receiving, via a control device, at least one signal concerning at least one operating parameter of the drive device and, in response to the operating parameter signal, controlling the reference force; and

exposing, as a result of movement of the pressure body within the housing, at least one first opening in the housing, thereby permitting venting of the pressure medium.

24. A process of claim 23, further comprising :

comparing, via the control device, a value of the at least one operating parameter signal to a predetermined value and controlling the reference force accordingly.

25. A process of claim 24, wherein the control device comprises a drive device control unit and wherein the predetermined value is selected with respect to a drive device status and is retrieved from a memory unit of the drive control unit.

26. A process of claim 24, wherein the at least one operating parameter signal comprises the pressure of the pressure medium.

27. A process of claim 23, wherein the housing defines a valve chamber on the second side of the pressure body and wherein the reference force is at least partially controlled by controlling the pressure inside the valve chamber.

28. A process of claim 27, wherein the pop-off valve further comprises a pressure equalization opening for throttled pressure equalization between the valve chamber and the pressure medium.

29. A process of claim 27, wherein the control device comprises a control valve connected to the valve chamber, the control valve being operated with respect to the difference between the predetermined value and a value of the at least one operating parameter signal to control the pressure inside the valve chamber.